Strategy Research Project

UNITED STATES GOVERNMENT SUPPORT OF PICKENS' ENERGY PLAN

BY

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USAWC CLASS OF 2009

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USAWC STRATEGY RESEARCH PROJECT

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Billionaire T. Boone Pickens began a media campaign in July, 2008 to convince the American public and U.S. Congress that the nation should embark on a plan to displace one-third of its oil imports with wind energy within ten years. The plan calls for wind turbines to generate 20 percent of the nation's electricity. This new wind energy will free natural gas, currently used in electricity generation, to replace 47 percent of the oil currently used in the transportation sector. Key to his plan, Pickens wants Congressional support in the form of an extension of the wind Production Tax Credit, legislation to support new electrical transmission lines, and the replacement of the government vehicle fleet with new natural gas vehicles. Although much has been made of Pickens' personal motivations for his plan, the project will exclusively focus on whether his plan is feasible and whether the government should support it.

UNITED STATES GOVERNMENT SUPPORT OF PICKENS' ENERGY PLAN

In July 2008, oil billionaire T. Boone Pickens launched a media campaign to convince the American public to support a plan to reduce United States' dependence on foreign oil imports. He proposed that the United States invest in wind turbines to power 20 percent of the nation's electrical supply. This 20 percent will replace electricity currently generated by natural gas. This natural gas can then be used to power transportation currently powered by gasoline and diesel fuel. This will decrease reliance on foreign oil by one-third within ten years.[1]

Specifically, there are three areas in which Pickens wants United States government support. First, Pickens asks that the Production Tax Credit (PTC) be extended from two years to ten years.[2] The current PTC of 1.9 cents per kilowatt hour is due to expire for wind generators built after December 31, 2009.[3] Second, he wants the government to commit to building new electrical transmission lines to support new wind power in the same way President Eisenhower called for the building of the interstate highway system in 1956.[4] This government support will come in the form of authority to declare eminent domain where needed.[5] Third, he wants the government to mandate that all new federal vehicles use natural gas as their fuel. According to Pickens this fleet is comprised of 200,000 vehicles.[6] Pickens' plan can found at the *Pickens Plan Home Page,* http://www.pickensplan.com.

On the surface, the Pickens Plan is an obvious, pragmatic solution to guiding our nation toward the worthy goal of energy independence. As with most strategic communications, the details below the surface of quick sound bites make implementation more difficult. Although much has been made in the media about

Pickens' motivations in seeking support for his plan, this project will not address them. Instead, this project will focus the proposals he makes for government support of his plan. It concludes with recommendations for our public officials.

Current United States' Oil Situation

Pickens asserts that "nearly 70 percent and growing" of United States oil is imported.[7] The Energy Information Administration (EIA) backs this claim, declaring the United States consumed 20.7 million barrels of oil per day in 2007.[8] Of this, 5 million barrels per day were produced in the United States or roughly 24 percent.[9] This means 76 percent of United States oil consumption was supplied via foreign sources. By 2030, the Government Accounting Office (GAO) in its 2007 report, *Crude Oil, Uncertainty About Future Oil Supply Makes It Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production*, expects oil consumption to be 27.6 million barrels per day, up 6.9 barrels from 2007.[10] The EIA predicts in its *Annual Energy Outlook 2008 (Early Release)* that United States' domestic oil production will peak at 6.4 million barrels per day in 2019 then decrease to 5.6 million barrels per day in 2030.[11] The report accounts for expected production in Alaska, the Gulf of Mexico and utilization of enhanced oil recovery operations. Combining their figures, the GAO and EIA predict the United States will import approximately 80 percent of its oil in 2030. According to the DOE, transportation consumed 70 percent of United States oil supplies in 2007.[12] With Pickens' projected one-third reduction in oil imports, oil use would be reduced 47 percent in the transportation sector alone.

Wind Energy

Pickens makes the claim that wind facilities in a corridor from Texas to North Dakota could produce 20 percent of the electricity for the United States. The cost will be $1.2 trillion.[13] However, he does not propose that this be funded by taxpayers. The U.S. Department of Energy (DOE), in its 2008 report "20% Wind Energy by 2030," predicts that while costs and challenges remain with powering 20 percent of electricity with wind, Pickens' assertion is feasible.[14] There are, however, two notable differences between the Pickens Plan and the DOE report. First, Pickens focuses on the corridor between the Texas panhandle and North Dakota as the centerpiece for wind development. The DOE report, however, makes the case for developing wind power throughout the continental United States to include off-shore wind turbines. Second, Pickens claims his plan can be fulfilled within ten years. The DOE report asserts the 20 percent scenario is achievable by 2030. It does acknowledge that this is only one of many possible scenarios and does not reject the idea that the 20 percent scenario could be achieved earlier than 2030.

Wind as a source of electricity is already a proven technology and improving every year. In fact, many power companies already generate 10 to 13 percent of their peak loads with wind turbines.[15] In total, wind currently accounts for approximately one percent of United States' electrical generation. [16] The DOE calls the status of wind turbine technology "roughly where the U.S. automotive fleet stood in 1940."[17] Although wind-generated electricity is generally thought of as expensive, its cost has dropped dramatically since 1980, the year commercial wind plants began operating in California.[18] Since 2002, the cost of wind energy has risen due in large part to shortages of wind turbines, a weak United States dollar (many components are

manufactured in Europe), a significant rise in material and transportation costs, and the unpredictable nature of wind energy Production Tax Credit.[19] Pickens recognizes the need for the PTC and suggests that rather than renewing the PTC every two years, the U.S. Congress should extend it for ten years, reasoning this would stabilize the wind energy market and make wind energy more attractive to potential investors.[20]

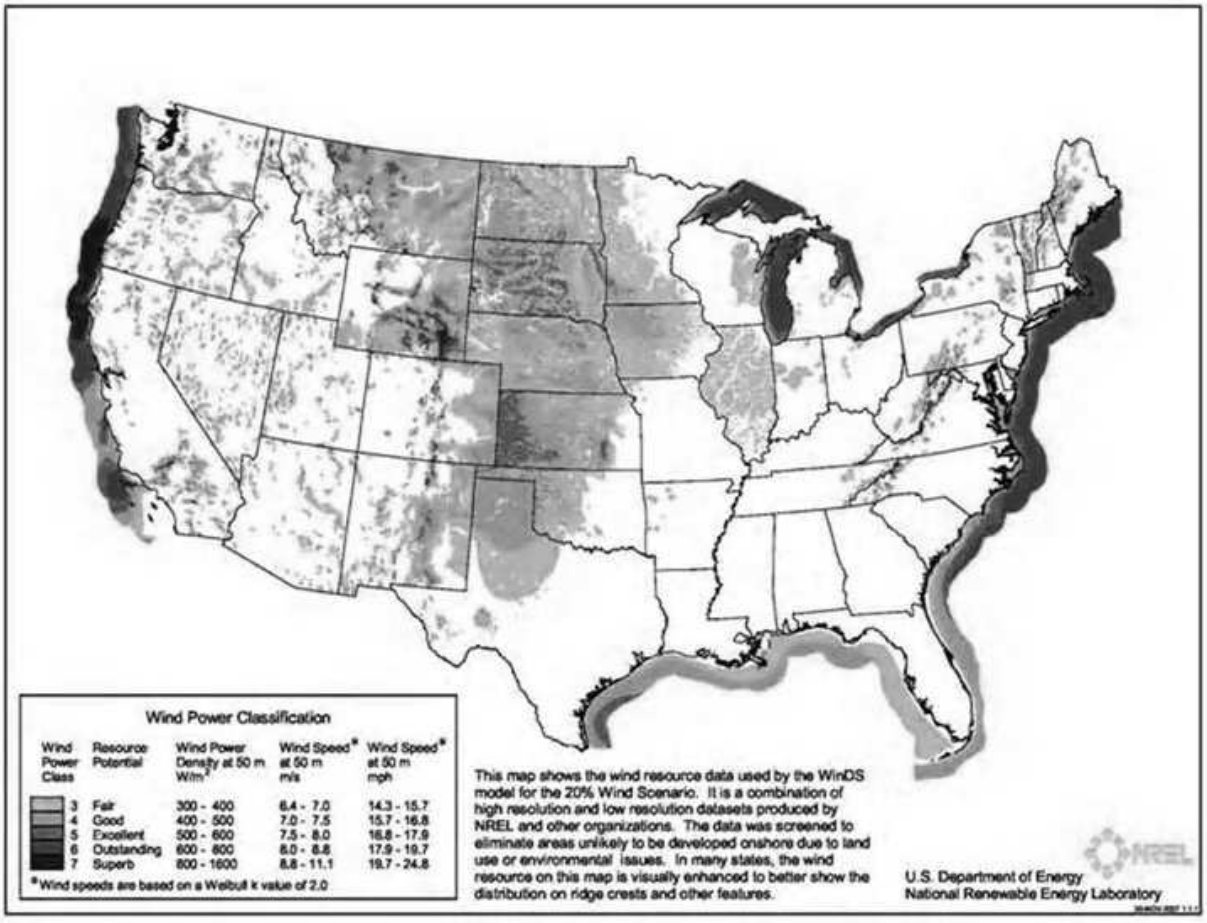

Figure 1: Wind Resource Potential at 50 meters Above Ground[21]

The original PTC became law under the Energy Policy Act (EPACT) of 1992.[22] Under the provisions of EPACT operators received a credit of 1.5 cents (1992 dollars) per kilowatt hour for the first ten years of output from plants entering service before December 31, 1999 at which time the PTC was due to expire.[23] Since its original

expiration in 1999, the PTC has experienced an unpredictable, two year, on-again, off-again cycle. Congress allowed the original PTC to expire as scheduled, but a few months later retroactively extended it to December 31, 2001.[24] Congress again let the PTC expire in 2001 and a few months later extended it retroactively to December 31, 2003.[25] The Working Families Tax Relief Act of 2004 extended the PTC to plants built on or before December 31, 2005.[26] President Bush signed the Energy Tax Incentives Act of 2005 on August 8, 2005, extending the PTC to December 31, 2007.[27] The Tax Relief and Health Care Act of 2006 extended the PTC to the end of 2008.[28] Finally, President Bush signed the Emergency Stabilization Act of 2008 on October 3, 2008, extending the PTC to December 31, 2009.[29] The current PTC is 1.9 cents per kilowatt hour of wind generated electricity.[30]

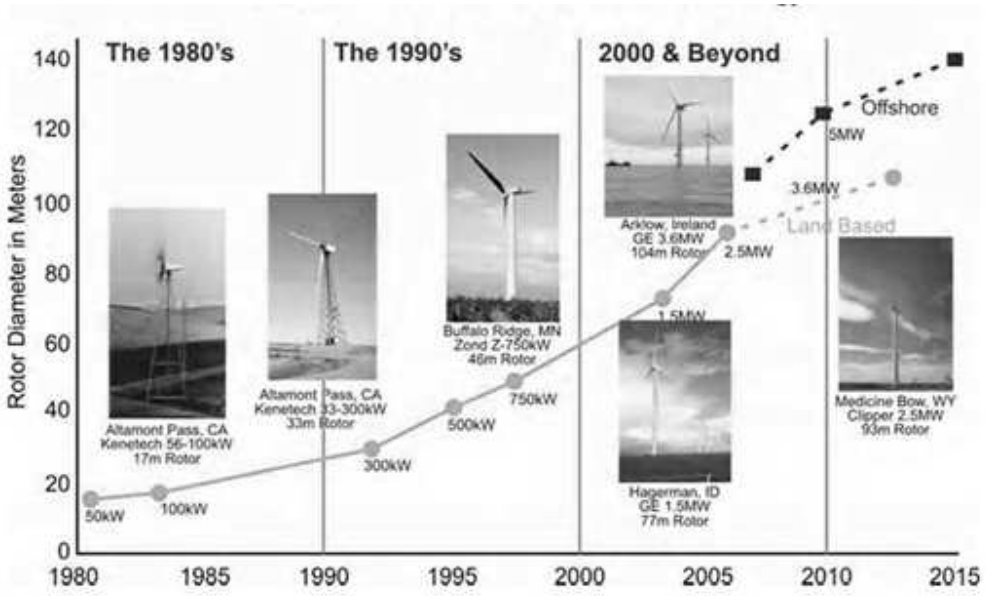

Figure 2: The Development Path and Growth of Wind Turbines[31]

Evidence suggests Pickens is correct in his assertion that the tentative nature of the PTC directly impacts investment in wind energy. In years when investors were unsure of the status of the PTC, wind capacity installation increased as follows: 2000-

67 megawatts, 2002-446 megawatts and 2004-389 megawatts.[32] In years when investors could count on the PTC, wind capacity installation increased as follows: 2001-1,697 megawatts, 2003-1,687 megawatts and 2005-an estimated 2,500 megawatts.[33] This represents more than 600 percent more capacity installation in a stable PTC environment than an unstable environment. According to the American Wind Energy Association, four to six months preceding expected PTC expirations, investors soured on wind energy.[34] While the PTC increases investment in wind generation capability, it also reduces revenues to the U.S. Treasury. In fact, between 2005 and 2008, the U.S. Treasury lost about five billion dollars due to the wind PTC.[35] According to the EIA, the amount of the PTC and the length of the extension have a predictable impact on tax revenues. A five year extension to the 1.9 cent per kilowatt hour (verses to normal 1-2 year extension), would decrease U.S. Treasury revenues another 5 billion dollars per year over the 5 billion dollar base rate.[36] A permanent extension to the PTC at the 1.9 cent per kilowatt hour rate would increases revenue losses 20 billion dollars over the base rate.[37] Pickens' estimate of 15 billion dollars per year cost to the government for a PTC extension of 10 years is in line with EIA estimates.

It is important to compare these estimated losses in revenue to what they achieve in projected wind generation capacity. Under the PTC status quo (renewal every 1-2 years at 1.9 cents) the EIA estimates the 10 gigawatts of wind energy produced in 2005 will increase to 18 gigawatts in 2030.[38] With a five year renewal of the 1.9 cent PTC, EIA predicts 2030 wind capacity at 24 gigawatts.[39] A permanent extension to the 1.9 cent PTC increases the predicted 2030 wind capacity to 48 gigawatts.[40] In its 2008 report "20% Wind Energy by 2030", the DOE estimates 12

gigawatts of electricity is currently generated using wind turbines and sets the 2030 target of 20 percent wind energy at 305 gigawatts.[41] Interestingly, the EIA report suggests that the PTC by itself will only achieve 16 percent of Pickens' stated goal of 20 percent wind power.

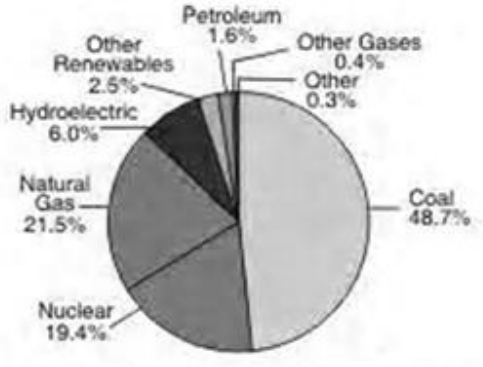

Figure 3: United States Electricity Generation Sources in 2007[42]

Figure 3 depicts the EIA's breakdown of the energy sources used to generate electricity in the United States in 2007. Although it would be useful to compare energy generation costs by source, it is surprisingly difficult to obtain direct comparisons. This is likely due to the varied nature of local circumstances around the United States, cyclical nature of electrical demand, and the many variable market forces impacting generation. It is interesting to note that the "EIA has neither historic nor current data on the cost to generate electricity from existing power plants that use renewable resources."[43] It is, however, useful to compare the 1.9 cent wind PTC with known costs involved in the electrical market. The EIA reports the average price of United States' electricity in 2006 as 8.9 cents per kilowatt hour, including residential, commercial, industrial and transportation usage.[44] According to the DOE, wind energy cost has dropped from 35 cents per kilowatt hour in 1980 to less than 5 cents per kilowatt hour at a good wind site.[45] DOE's stated goal for wind generation costs are 3 cents per kilowatt

hour at a low speed wind site and 5 cents per kilowatt hour for off-shore sites by 2012.[46] As a further point of comparison, The Nuclear Energy Institute calls nuclear plants the "lowest cost producer of baseline electricity," stating nuclear generated electricity costs 1.76 cents per kilowatt hour, including the costs of operating and maintaining the plant, fuel purchase and used fuel management.[47] In his June 17, 2008 testimony to the Senate Energy and Commerce Committee, Pickens stated "wind will be cheaper than anything else" and further said "we're there with wind," meaning wind is already cheaper. This naturally begs the question as to why a PTC is necessary at all. In fact, Pickens believes that private capital could pay for the wind generation and transmission infrastructure with or without the PTC but that the PTC will accelerate its construction.[48]

Pickens also acknowledges the investment required for transmission lines to support the new wind turbines. These turbines would be strategically located in areas with the most favorable wind conditions, not necessarily near population centers. The DOE predicts 12,000 miles of new interstate transmission lines would be required to support their 2030 scenario at a cost of $20 billion. For comparison, there are currently 200,000 miles of transmission lines in the United States that support 230 volts and higher.[49] While this may appear to be a Herculean task, the DOE reminds us that every new energy generation construction has required similar construction of new transmission lines. The list includes hydro-electric power in the 1930s through 1950s, nuclear and coal plants in the 1960s and 1970s and natural gas-fired plants in the 1990s.[50] The report concludes that as United States' demand for electricity grows (as is expected), transmission capability must also grow, regardless of wind's future role.[51] In

his testimony to the U.S. Senate Energy and Commerce Committee on June 17, 2008, Pickens remarked that the transmission lines can be built using private capital.[52]

Opposition to these new transmission lines will likely not develop as a result of their cost, however. More likely, opposition will develop as large transmission lines are strung through private lands. Pickens compares the building of the new transmission lines to Eisenhower's building of the interstate highway system in 1956.[53] On the surface, the comparison is designed to inspire the American public. However, it is also designed to generate the public support, and hence Congressional and Presidential support, required to invoke eminent domain. The fifth amendment of the U.S. Constitution prohibits the taking of private property stating "nor shall private property be taken for public use without just compensation."[54] Prior to 2005, no federal agency had the authority to authorize new siting of electrical transmission lines.[55] The 2005 Federal Power Act (FPA) changed this by granting the Secretary of Energy the authority to designate National Interest Electric Transmission Corridors when the Federal Energy Regulatory Commission finds that one of four conditions exist. The first is when a state lacks the authority to approve the building of such corridors (national forest for example). The second is when the electric retail company needs the transmission corridor in a state in which it does not sell electricity. The third is when the state siting authority fails to authorize an application for construction within one year. The fourth is when the state siting authority attaches conditions which render the construction economically infeasible.[56] As written, the law is intended to overcome state siting constraints in areas experiencing electric capacity limitations where states were making decisions about electric transmission corridors without consideration as to their

importance to the national electric grid.[57] Although the FPA authorizes the DOE to grant eminent domain authority to concerned electric companies, it does not appear to be intended for the situation proposed by Pickens.

If the 2005 FPA serves as an example of the time required such a law to pass, it will be four years before the Congress passes a law authorizing eminent domain for the purpose of national security or in the name of energy independence. It was May, 2001 when the presidentially-appointed National Energy Policy Development (NEPD) Group recommended to President Bush that transmission capacity limits could lead to reliability problems and pricing pressures in California, Long Island, the Southeast and New England.[58] A year after the NEPD Group published its report, the DOE reached a similar conclusion.[59] These reports eventually led to the 2005 FPA which was first utilized in an eminent domain case in 2007. In a climate of high energy prices as experienced in the summer of 2008, Pickens will likely experience high public support for a law mandating eminent domain in the name of energy independence. However, in a climate of decreasing energy prices as experienced, and further predicted in the winter of 2008/2009, the public will be immensely less interested. Eminent domain is not one of the publically highlighted aspects of the Pickens Plan and is addressed very subtly. It is however, likely to be the most politically charged aspect of his plan. Gasoline prices are likely to drive Congressional support or rejection of this part of the plan. Clearly, as the public realizes that wind power means citizens will be forcibly displaced from their homes and businesses, there will be some, yet undetermined, public opposition to the new transmission lines. It remains to be seen whether public support for energy independence will overcome this opposition.

United States' Natural Gas Supply

Pickens implies that natural gas is a cheap and abundant resource in North America (United States, Canada and Mexico), stating "Natural gas is significantly less expensive than gasoline or diesel. In places like Utah and Oklahoma, prices are less than $1 a gallon" and that "98% of the natural gas used in the United States is from North America."[60] Although both statements are correct, they do not paint the entire picture with respect to United States' natural gas. In fact, the National Petroleum Council, in its 2007 report, *Hardtruths, Facing the Hard Truths about Energy*, predicted that future United States' natural gas production would likely lag projected demand, requiring significant growth in LNG [liquefied natural gas] imports.[61] The report also finds that while United States' production has been relatively flat for the past 35 years, Canadian production has filled a growing demand. Since 2003, the United States has relied on liquid natural gas (LNG) imports to fill shortfalls. In 2006, LNG imports comprised two percent of the United States' natural gas supply.[62] From an energy security standpoint, it is interesting to note that two thirds of current proven natural gas reserves are in Russia, Iran, Qatar and Saudi Arabia.[63]

The future of United States' domestic natural gas production is certainly debatable. The EIA currently projects that by 2030, the United States will be importing 7.7 billion cubic feet per day of liquefied natural gas to make up for declining production of Canadian natural gas. This projection includes increasing Alaska's production from today's 1.1 billion cubic feet per day to 5.5 billion cubic feet.[64] However, according to the National Gas Supply Association, natural gas produced from shale could double in the next ten years from its current 6 to 8 billion cubic feet per day to 12 to 20 billion cubic feet per day.[65] According to the association, today's shale production accounts for

10 to 12 percent of the United States' average daily natural gas consumption of 60 billion cubic feet per day.[66] Additionally, the association claims the increase in natural gas production from shale will increase to one quarter of United States' supply within 10 years.[67] Others are even more optimistic. Navigant Consulting and the American Clean Skies Foundation report that the seven largest United States' shale formations alone will produce at least 27 billion cubic feet per day of natural gas or 43 percent of current United States' consumption.[68] This diverges from the DOE estimate of 26 billion cubic feet per day from all unconventional sources (shale, coal beds and tight sands) by 2030.[69] There are approximately 20 major shale formations in the United States that could or currently produce natural gas. They include the Bakken play in North and South Dakota, the Woodford in Oklahoma, the Haynesville area in Texas and Louisiana, and the Green River Piceance basin in Colorado.[70]

Future Role of Natural Gas in United States' Economy

What is the mechanism by which wind will replace natural gas in generation of electricity? On June 17, 2008, Pickens testified to the Senate Energy and Commerce Committee. When directly questioned by Senator Jeff Bingaman (Democrat-New Mexico) about government's role in the transition, Pickens characterized the transition from natural gas to wind as driven by the lower cost of wind and the natural tendency of companies to gravitate to the cheapest way to generate electricity. He suggested that government's role was to "let it happen" and "encourage it to happen" implying the only legislation required for a quick transition is the wind PTC.[71] But in an October 27, 2008 interview with CBS' Sixty Minutes, Pickens remarked that replacement of natural gas

with wind power by electrical generation companies “may be a mandate,” indicating that in order for wind to replace natural gas, legislation may be required.[72]

A quick survey of natural gas prices around the United States shows that Pickens’ assessment of one dollar per gallon in Utah and Oklahoma are approximately correct.[73] A quick internet query shows natural gas at 80 cents and $1.17 per gallon (gasoline gallon equivalent of natural gas), respectively.[74] However, other states like North Carolina and Oregon see natural gas at $2.41 and $2.53 per gallon.[75] When vehicles begin to directly compete with electric utilities for limited natural gas supplies, it is likely the price of natural gas will increase.

Pickens suggests that natural gas vehicles are cleaner than gasoline and diesel powered vehicles, stating “According to the California Energy Commission, critical greenhouse gas emissions from natural gas are 23% lower than diesel and 30% lower than gasoline.”[76] However, using technical data on the only United States’ production natural gas passenger car, the Honda Civic NGV and data from the Bioenergy Feedback Development Program at the Oak Ridge National Laboratory, natural gas vehicles look less eco-friendly.[77] Using Honda’s performance data, this project compared the Honda Civic Sedan (conventional gasoline engine), the Honda Civic Hybrid and the Honda Civic NGV. Each is essentially the same vehicle with a different type of engine and they make an excellent comparison. On the same 200 mile drive, the Sedan produces 16.70 kilograms of carbon, the Hybrid produces 11.52 kilograms of carbon and the NGV produces 12.57 kilograms of carbon (see Figure 4). Although the Honda Civic NGV may produce fewer pollutants than gasoline or diesel vehicles, it clearly produces more carbon and therefore, more carbon dioxide.[78]

Natural gas vehicles have other drawbacks when compared to their gasoline and diesel equivalents. First, natural gas vehicles are more expensive than other vehicles, $1,500 to $4,500 more expensive than conventional vehicles according to the GAO.[79] The manufacturer's suggested retail price of the Honda Civic Sedan, Hybrid and NGV are $15,090, $23,550 and $25,090, respectively.[80] Second, natural gas refueling stations are not readily available across the nation. This situation would likely improve as numbers of natural gas vehicles increased. However, until such time, retailers will be hesitant to install natural gas dispensers for a market that might not develop. This is the classic "chicken and egg" scenario. Third, natural gas vehicles have less range than conventional vehicles. According to Honda, the ranges of the Honda Civic Sedan, Hybrid and NGV are 343-449 miles, 492-554 miles and 192-289 miles, respectively.[81] To date there is little economic reason for a consumer to purchase a natural gas passenger car. Future tax credits for owning natural gas cars could offset the higher cost. Thus far, Pickens has not recommended such incentives.

1 gasoline gallon equivalent (GGE)=126.67 ft^3 of natural gas
126.67 ft^3=3.59 m^3
3.59 m^3 of natural gas (1 GGE) x 0.49 kg carbon/m^3 natural gas=1.76 kg carbon per GGE of natural gas

Honda Civic Sedan
29 miles/gallon (highway and city combined)
200 miles ÷ 29 miles/gal=6.90 gal
6.90 gallons of gasoline x 2.42 kg carbon/gal=16.70 kg carbon

Honda Civic Hybrid
42 miles/gallon (highway and city combined)
200 miles ÷ 42 miles/gal=4.76 gal
4.76 gallons of gasoline x 2.42 kg carbon/gal=11.52 kg carbon

Honda Civic NGV
28 miles/gallon (highway and city combined)
200 miles ÷ 28 miles/gal=7.14 gal
7.14 GGE of natural gas x 1.76 kg carbon/gal=12.57 kg carbon

Figure 4: Carbon Emission Calculations[82]

Pickens actually wants to target trucks for a switch to natural gas. According to him, “Of all the oil used for transportation, 38% is used by fleet vehicles-trucks , buses, municipal and utility vehicles.”[83] With current costs of natural gas trucks it is hard to imagine trucking companies embracing the purchase of natural gas trucks except in an environment where natural gas costs significantly less than diesel fuel in order to recoup the difference. Currently, natural gas powered, day-cab trucks cost twice as much as diesel powered trucks which retail for $200,000 and higher.[84] Additionally, the LNG stations required to power these trucks will cost anywhere from $350,000 to $1 million.[85] Like the passenger car example, the purchase of both trucks and LNG refueling stations represents a chicken and egg scenario whereby both are required for success, yet investors on both sides are unsure of the viability of the other side. It is very likely that government tax credits will be required to encourage natural gas trucks if they are going to be successful. Thus far Pickens has not made such a recommendation.

Pickens suggests that the United States government lead the natural gas vehicle effort by replacing its current fleet of 200,000 vehicles with natural gas vehicles.[86] The Energy Policy Act (EPACT) of 1992 requires that 75 percent of a federal fleet’s new light duty vehicles in a metropolitan area must run on alternative fuels.[87] Natural gas is among the fuels the EPACT listed as alternative.[88] The U.S. Government Service Administration (GSA) reports that in 2007, the federal fleet had 642,233 vehicles.[89] Of these, 231,213 were passenger vehicles, 400,471 were trucks and the remainder was classified as “other.”[90] 9,288 vehicles in the federal fleet are powered by compressed natural gas.[91]

As part of his plan, Pickens wants the government to mandate that all new federal fleet vehicles be powered by natural gas. He further states "Because the fuel [natural gas] is cheaper than gasoline, they would immediately start saving taxpayer money".[92] As a point of comparison, we can assume the government purchases 2008 Honda Civics to replace its fleet of 48,495 compact cars.[93] The gasoline powered Honda Civic Sedan costs $15,405 and gets 29 miles per gallon of gasoline.[94] The natural gas powered Honda Civic NGV costs $25,090 and gets 28 miles per gasoline gallon equivalent (GGE) of natural gas.[95] Because the NGV costs more than the Sedan, the consumer, in this case the government, must make up the difference over time by saving money on fuel. The GSA reports that government sedans and station wagon averaged 12,372 miles per vehicle in 2007.[96] Assuming gasoline is $4 per gallon and natural gas is $1 per GGE, it will take 7.6 years to recoup the higher cost of the NGV. Assuming $5 gasoline and $1 natural gas, it takes 5.7 years to pay the difference. Assuming $4 gasoline and $2 natural gas, it takes 11.8 years to pay the difference. See Figure 5 for the calculation of this data. According to the GSA, the average age of the government's sedans and station wagons is 4.7 years while the average age of the total federal fleet is 9.5 years.[97]

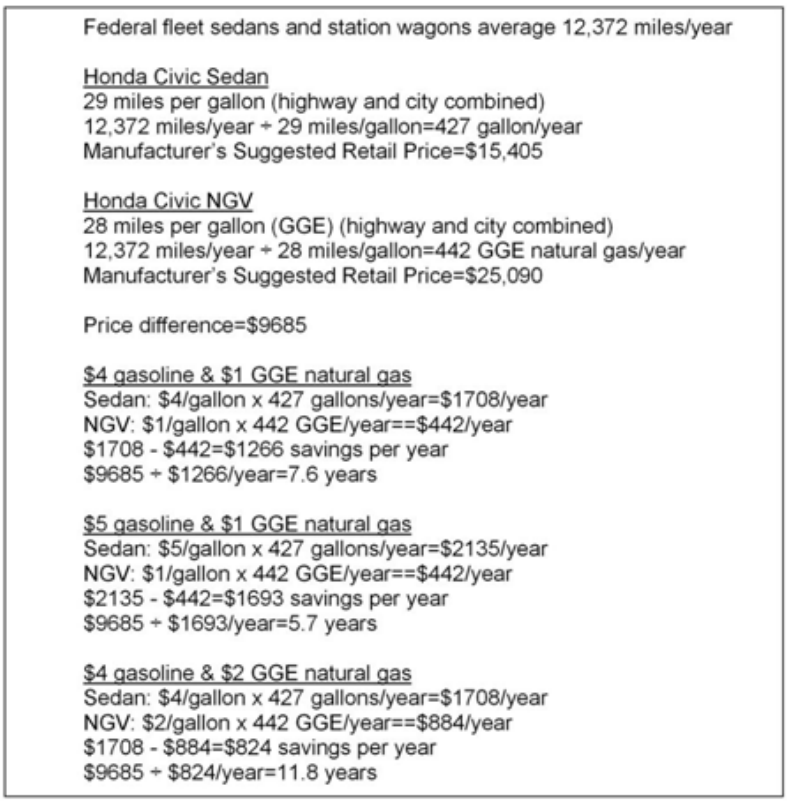

Figure 5: Federal Fleet Payback Calculations[98]

Conclusion

Pickens makes three requests of Congress. "First-they need to extend the renewable Production Tax Credit (PTC) for ten years instead of two."[99] He makes an excellent point in that the history of the PTC is one of inconsistency and lack of long term commitment. This directly affects investment in wind energy. In years where investors could count on the PTC, wind capacity increased at a rate more than six times that of years where the PTC was in doubt.[100] Pickens' estimate of $15 billion per year in lost revenue to the treasury is appears accurate according to separate calculations by the EIA. However, the same EIA calculations predict the PTC alone will not encourage the investment necessary to produce the wind capacity required for the 20 percent wind scenario.

In the current economic crisis, support of the PTC may be considerably less than support in normal economic times. When the public learns that it will be supporting the wind industry by $15 billion dollars per year, they will immediately draw a comparison to the controversial "bailouts." The timing for the ten year PTC is not good due the current poor economy, but Congress should still support this aspect of the Pickens plan. Although the current PTC isn't scheduled to expired until December 31, 2009, Congress should extend it ten years to signal its commitment to wind energy very soon. The best time to introduce the legislation is early in the Obama administration when the American public is hungry for change and eager to embrace a vision of future energy independence.

"Second-we need to have new transmission corridors to bring the power from the wind corridor to the cities where it is needed most."[101] For Congress, the issue with building these transmission lines is not money; it is the rights of property owners versus the public good. There will no doubt be opposition to the declaration of eminent domain required to build these lines. The vigor of the opposition depends on many factors, not the least of which is the price of gasoline. This, it seems, directly drives public interest in alternate energy. In a climate of four or five dollar gasoline, public outrage will engender support for more drastic energy solutions. Eminent domain will enjoy greater support from both the public and Congress in a high gasoline price environment. This said, Congressional support for eminent domain is an important signal to wind investors and will work in concert with the ten year PTC to boost investment. It is required sooner rather than later. However, this legislation should be introduced during a time of public outrage over gasoline prices. In the current climate of two dollar gasoline, public

sympathy will gravitate to the citizens losing their homes rather than future energy independence. To introduce the legislation in this environment would unduly risk the failure of a key aspect of the Pickens Plan.

Lastly, "The federal government should take the lead and mandate all new federal government fleet vehicles use natural gas as their fuel."[102] On this point, this project finds that Pickens has not made his case. Specifically, Pickens seems overly optimistic about the domestic natural gas supply. He clearly attempts to convince his audience, the American public and Congress, that the United States has ample domestic reserves of natural gas. The EIA thus far does not share Pickens' optimism. This is not to say that Pickens is incorrect in his predictions about natural gas but that he owes the public and Congress a more thorough and convincing case for natural gas supplies. Until this occurs, Congress should not even consider mandating natural gas for federal government fleet vehicles. To do otherwise risks support of a fuel that may cause further dependence on foreign sources. The Congress may essentially be switching from one form of foreign energy dependence to another. Support of the natural gas portion of the Pickens Plan is premature. This project recommends that Congress does not support this aspect of the plan until the EIA endorses Pickens' view of the future of domestic natural gas reserves.

It is possible that Pickens and the natural gas companies cannot or, for proprietary reasons, choose not to convince Congress that enough domestic natural gas reserves exist to warrant a switch from gasoline to natural gas. This should not dissuade support for the wind PTC or new transmission corridors. It is possible that Congressional support for the natural gas aspect of the plan would never develop. This

would not be catastrophic to its overall success as 20 percent of the nation's electrical supply would still come from wind. Moreover, the transition to natural gas could still occur via market forces.

Pickens' somewhat low-key admission that government mandates may be required to force natural gas out of electricity production is even more troubling, even if sufficient domestic natural gas reserves are proven. With the state of domestic natural gas reserves in question, it is irresponsible for Congress to signal any support to move natural gas from its current niche market to the transportation sector.

However, Congress should proceed with support of the wind industry as Pickens outlines. In a worst case natural gas scenario, when wind successfully penetrates the electricity generation business, markets forces will determine the source it replaces. This is the best method to ensure the government does not bolster an unviable domestic source. Obvious natural gas competitors for market share of electricity generation are nuclear and coal. While this project supports immediate adoption of the wind PTC and transmission corridors, political considerations dictate that Congress not engage in this debate until conditions are right to engender public support.

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